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PRINCIPAL INVESTIGATOR: Col Warren Whitlock

CONTRACTING ORGANIZATION: Southeastern Regional Medical Command
Fort Gordon, Georgia 30905-5650

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6. AUTHOR(S)
Col Warren Whitlock

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)
Southeastern Regional Medical Command
Fort Gordon, Georgia 30905-5650

E-Mail: warren.whitlock@se.amedd.army.mil

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The medical objective was to provide for current command priorities which included daily DNBI reports by medical units to the C2. The current DNBI reporting was performed in theater and used a daily handwritten count collected by visiting each medical unit - BAS to the CSH in theater. Human error created several problems that could be solved utilizing a digital system with primary identification data capability and automatic compiling for reporting. The system must meet with user needs and with command needs, as well as fit the communications architecture and be supportable based on the level of personnel training in theater.

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Develop and Operationally Test a Digital Internet Based Information System for Theater Digital Force Health Protection and Disease Surveillance

Introduction

The Center for Total Access, Southeast Regional Medical Command provided assistance with developing an advanced technology tool to support Force Health Protection in Exercise Bright Star, 2001. Medical situation awareness allowing early command decisions, accomplished by using computerized technology for collection of medical information in the theater as well as in CONUS, was defined and given the name "Digital Force Health Protection." A Portable Data Assistant (PDA) was used utilizing the USAF Global Expeditionary Medical System (GEMS) with modifications requested by the Center for Total Access. Modifications to GEMS were requested to improve the accuracy of legacy data input at the point of care to meet the medic's requirement for a portable, rapid interface, which could then be downloaded to a laptop computer and the ability to print standard medical forms.

Body

The requirement for a portable, rapid interface, tool to input data at the point of care for medic's in theater that would also allow the medic to download data into a laptop or desktop computer which would provide the user the ability to print standard medical forms became apparent to improve health care in theater.

In Phase I of Digital Force Health Protection, hardware and software solutions were integrated into the Bright Star Exercise, 2001 operational plan. The Center for Total Access configured PDA's for a Joint Task Force Team consisting of US Army and US Air Force members who spent nine days during the exercise implementing and training personnel on the utility of the PDA's and the GEMS system.

Medical data was collected from a Battalion Aid Station (BAS) and a Combat Support Hospital (CSH) and the data was forwarded to 3rd MEDCOM Headquarters in a deployed field location in Egypt. This information was sent with a secure transmission over store and forward to CONUS (Fort Gordon, Georgia) and warehoused at the Center for Total Access. The proof-of-concept demonstration hosted two days of data from soldiers from medical encounters collected during Bright Star on a secure web portal within twenty-four hours of patient encounter.

Non-networked Panasonic Tough-book computers with Symbol industrialized PDA were selected for field deployment. A non-network design was used for rapid implementation training with pre-set synchronization with the PDA. The laptops were configured for

DoD standards by Center for Total Access personnel using a Windows 2000 operating system and the modified GEMS program along with the Special Operations Forces Medical Handbook, Form Flow, and Office 2000. The Center for Total Access after receiving an operational requirement to add 2-D barcode reading capability to enter medical identification data into GEMS obtained a USMC developed 2-D barcode reading program used for personnel purposes and assisted the GEMS programming consultant with inserting this capability into the PDA program for GEMS. The Center for Total Access also embedded desktop training and reference capability into the PDA. A stepwise interactive system based on web-page design illustrates the AOR, mission objectives and links to help files for GEMS and for the Special Operations Forces Medical Handbook. This upgrade allows the user to select the type of information in the format that favors their specific requirements, which in turns improves user acceptance and speeds training implementation.

Reportable Outcomes

- First medical use of 2-D barcode scanning of identification information on the back of military ID cards using a PDA.
- Comprehensive medical record data and information concerning Disease Non-Battle Injury in theater was collected at the Point-of-Care.
- Medical data was warehoused at each military node-echelon and available to each commander at that node for access to local medical information for command decisions insuring Force Health Protection of personnel.
- Successful Syndromic disease surveillance supporting the DOD/GEIS concept for possible biological terrorism and complete data archival by 3rd MEDCOM Forward for Command and Control in the theater.
- Transmission from theater headquarters in Egypt to a military base in the USA for complete data replication and duplication for permanent archival in less than 24 hours.
- Significant reduction of errors in reporting DNBI rates for hand counting of patient disease surveillance compared to digital computerized capability for Force Health Protection.
- Adoption of a modified version of this system by the Navy Medical Research Laboratory (NMRU3, Cairo, Egypt) for the DOD Diarrhea study in Incirlik, Turkey.

Conclusions

Accurate PEM Data Entry Echelon I-III with Archival and Query (reporting) was demonstrated successfully.

The implementation of GEMS was in addition to the standard reporting requirement. Utilizing GEMS should replace the standard method of paper and hand counting by performing this task with more efficiency and accuracy. Furthermore, the ability to archive, transmit, and access with ad hoc query at a later time, make this capability beneficial for all future deployed operations.

Joint Patient DNBI accounting was demonstrated.

Two disease categories (respiratory and gastrointestinal) accounted for two-thirds of all the DNBI cases in the AOR over three days of data collection. An increase in any disease rate should alter the command that a medical threat to force health protection exists. The problem is that careful tracking of these numbers without a configured medical data system is nearly impossible. The error rate produced by hand written data is unacceptable in medical situational awareness.

Theater Epidemiology Module (TEM) was demonstrated with potential of complete AOR surveillance for situational awareness for Command & Control.

This information management system in the PEM (Patient Encounter Module) and the TEM was customized to location specifics within the AOR. This provided the ability to run DNBI rates for the entire AOR in under five seconds. Any disease rate that reached the DNBI threshold was highlighted yellow and moved to the top of the screen. Any disease rate that exceeds the threshold was highlighted red and moved above the yellow flags.

Chemical/Biological Surveillance – GEIS Standard.

The PEM portion of GEMS provides data fields for symptoms and signs during a medical evaluation. The ability to design a query based on any symptom combined or separate with any physical finding, combined or separate with type visits, and type of personnel provides for syndromic surveillance. This is a recognized standard for sensitive monitoring for environmental, occupational, biological warfare agents, and for DNRI reporting.

TEM Map View

This capability provides situational awareness using geographic maps, which can be accessed for data by clicking the site or name. This technology also provides for global positioning systems, which were not used for this demonstration.

Command & Control Web Portal Service was hosted by SERMC.

This is a web-based large capacity management system featuring SIPRnet compatible features. We used a feature in GEMS to demonstrate reporting of counts in an exportable report mode and hosted this information in an HTML and PDF File format which provides detailed information concerning DNBI summaries for the AOR.

References

None available at this time.